Math Curriculum Map

This map details the skills and understandings that students will develop through their work across the 9 units. The chart guides teachers to see which skills are explored in each unit. You will notice that many skills are developed over several units and that others come back in later units. This spiraling is designed to support student retention and transference of fundamental content. You will also notice that that there is generally an overlap from one unit to the next. This is to reinforce and build off of prior understandings.

DESCRIPTION	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	UNIT 7	UNIT 8*	UNIT 9
Understanding that for each input in a function, there can be only one output.	X								
Using a one or two-operation rule to complete an In/Out function table.	X	X	X	X	X				
Given a rule, determining an output from an input and vice versa.	X		X		X	X			
Identifying a one-operation rule that fits a given table of In/Out values	X								
Identifying a two-operation rule that fits a given table of In/Out values	X	X	X	X				X	
Understanding that a function rule must fit all the In/Out values in the table for that function	X		X	X					
Creating function rules in abstract context and using them to complete an In/Out function table.	X		X						
Creating, reading, and interpreting tables		X				X			
Creating tables from one- and two-operation rules		X	X						
Plotting points in a one-quadrant graph		X	X	X		X			
Relating tables to linear graphs		X	X		X				
Relating tables to nonlinear graphs					X	X			
Drawing inferences and conclusions based on graphed data		X	X	X	X				
Interpreting points on a graph in real-world contexts		X	X	X	X				
Using graphs to fill out tables and create function rules		X							
Testing whether an ordered pair fits a function, using the rule or the graph		X	X						
Discovering the relationship between rate of change, starting amount, and function rules.			X						

DESCRIPTION	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	UNIT 7	UNIT 8*	UNIT 9
Using rate of change and starting amount to determine function rules from tables.			■	■				■	
Determining rate of change, starting amount, and function rules for contextualized problems.			■	■					
Working with fractional rates of change			■	■					
Creating function rules that describe real-world situations or visual patterns			■	■				■	
Writing systems of equations in two variables				■					
Using tables and graphs to compare two linear functions				■					
Understanding the significance of the point on the graph where two lines intersect				■					
Using tables, graphs, and guess & check to find solutions to systems of linear functions				■					
Seeing applications of systems of equations in science and social studies contexts				■					
Using systems of equations to make and justify choices				■					
Interpreting systems of equations as a means of negotiation between competing interests				■					
Interpreting variables in function rules describing real-world contexts			■	■					
Translating to formal function notation			■	■	■	■			
Interpreting function rules that describe real-world situations			■	■	■	■			
Using charts, tables, drawings and graphs to analyze nonlinear change					■				
Graphing quadratic functions and relating them to function tables					■				
Generating outputs from a rule written in function notation					■	■			
Understanding constraints on the domain (possible inputs) of a function given a particular context			■		■				
Seeing and recognizing the difference between the graphs of quadratic and cubic functions					■				
Applying quadratic function rules in specific problem-solving contexts					■				
Using tables, charts, and drawings to model exponential growth and decay						■			
Seeing exponential growth/decay models in word problems						■			
Distinguishing between situations that can be modeled with linear and exponential functions						■			

DESCRIPTION	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	UNIT 7	UNIT 8*	UNIT 9
Observing that a quantity increasing exponentially will eventually exceed a quantity increasing linearly or as a polynomial function						■			
Noticing that, in exponential functions, the variable is in the exponent position, and interpreting equations accordingly						■			
Developing fluency with the different properties of equality							■		
Creating equations with two or more variables to represent relationships between quantities			■				■		
Identifying patterns and observing change	■	■	■	■	■			■	
Using patterns to make predictions and generalizations			■					■	
Collecting data in a table		■	■	■					
Developing strategies to move from concrete to abstract models							■		■
Finding recursive and explicit rules		■							
Creating a written description to define a linear function relationship		■						■	
Understanding the use of a variable in the context of a function with two unknowns, (asopposed to solving for a specific value of the variable)			■	■	■			■	
Solving one-variable equations with one or two-operations (finding the input when given the output of a known function rule)	■		■				■		
Connecting pattern exploration and algebra								■	
Understanding multiplication as repeated addition									■
Develop a better sense of numbers, especially to compose, decompose and factor integers									■
Understand the connection between the multiplication of integers and the multiplication of polynomials									■
Understanding and using the commutative and distributive properties of multiplication									■
Calculating area and perimeter of rectangles									■
Multiplying two-digit numbers									■
Multiplying binomials and trinomials (polynomials)									■
Understanding that two binomials are factors of a single trinomial									■
Combining like terms									■

* The student objectives for the lessons in **Unit 8: Algebraic Reasoning through Visual Patterns** are included in the chart above. The introduction to Unit 8 also describes a wide range of other math content you can teach through visual patterns, seen below. Using visual patterns to draw out the content below holds further potential for reinforcement and deepening the concepts listed above.

- organizing data (tables and graphs)
- creating/constructing expressions
- creating/constructing equations
- understanding multiple uses of variables and constants
- linear equations (like the arch problem)
- matching function equation to a situation
- connecting parts of equations to concrete pictures
- rate of change/slope
- starting amount/*y*-intercept
- graphing (coordinate plane, ordered pairs)
- equivalent functions/expressions
- combining like terms
- evaluating functions
- identifying graph of function (linear and quadratic)

- simplifying expressions
- input/output tables
- independent/dependent variables
- coefficients
- the difference between an expression and an equation
- quadratic equations
- comparing linear, quadratic, cubic functions
- second differences in quadratic functions
- algebraic notation/function notation
- polynomials
- solving for a specific value of a variable
- order of operations
- skip counting
- area and perimeter
- exponents
- perfect squares